IN THE CLAIMS

1-18 (Cancelled).

19. (Currently Amended) A precision Multi-dimensional capacitive transducer comprising:

a plurality of drive plates, said plates being composed of electrically conductive material;

pickup electrode means movably mounted relative to said drive plates;

further including: electrical circuit means for applying electrical drive pulses said drive plates, said drive plates being operatively grouped into pairs, said pulses to having a frequency F, and a pulse width T of approximately 1/F divided by the total number of drive plates, said drive pulses being grouped into one main channel per operative drive plate pair, each main channel ~~consisting of~~ comprising two sub-channel pulses, one sub-channel pulse of said main channel operative on a first drive plate of said drive plate pair, with remaining sub-channel pulse of said main channel simultaneously operative on remaining drive plate of said drive plate pair, with said main channels being multiplexed to sequentially apply said pulses to said drive plates with each main channel dedicated to a particular drive plate pair, and with said main channels being spaced apart in time by approximately the pulse width T;

sampling means for synchronously demodulating and demultiplexing the signal on the pickup electrode means into one channel per drive plate pair, each channel ~~consisting of~~ comprising two sub-channel signals, each channel operatively associated with a particular drive plate pair;

timing means for controlling said sampling means such that each first sub-channel is sampled during the time period that the drive pulse is applied to the corresponding drive plate pair and each second sub-channel is sampled after the drive pulse corresponding to that drive plate has ended, and before the drive pulse corresponding to the next channel in said multiplexed sequence is applied;

storage means for each sub-channel; and

differential amplifier means to convert each of the sub-channel signal pairs into single main channel signals.

20. (Previously presented) The capacitive transducer of Claim 19, wherein said main channel signals generated by said differential amplifier means constitutes the outputs of the transducer.

21. (Previously Presented) The capacitive transducer of Claim 19, wherein said drive plates comprise eight plates, further comprising:

electrical circuit means summing all four main channel signals together, said summed signal constituting the Z-axis output signal;

electrical circuit means generating the difference of two of said main channels, said difference signal constituting the X-axis output signal; and

electrical circuit means generating the difference of the two main channel signals not used to generate the X-axis output, said difference signal constituting the Y-axis output signal.

22. (Previously Presented) The capacitive transducer of Claim 19, wherein each of said main channel signals generated by said differential amplifier means are connected to feedback circuit means which produce feedback signals which control the amplitude of the drive plate pulses in response to displacement of the pickup electrode means relative to the drive plates, such that the induced voltage on the pickup electrode means is forced to zero, and the feedback signals generated by said feedback circuit means are proportional to the displacement of the pickup electrode means relative to the drive plates.

23. (Previously presented) The capacitive transducer of Claim 22, wherein said feedback signals constitute the outputs of the transducer.

24. (Previously Presented) The capacitive transducer of Claim 22, wherein said drive plates comprise eight plates, further comprising:

electrical circuit means summing all four feedback signals together, said summed signal constituting the Z-axis output signal;

electrical circuit means generating the difference of two of said feedback signals, said

difference signal constituting the X-axis output signal; and

electrical circuit means generating the difference of the two feedback signals not used to generate the X-axis output, said difference signal constituting the Y-axis output signal.

25-43 (Cancelled).

44. (Currently Amended) A precision Multi-dimensional capacitive transducer comprising:
pickup electrode means comprising a centrally located center electrode;
a plurality of pairs of drive plates, one of each of said pairs of drive plates being disposed on each of opposing sides of said center electrode, means for supporting each of said drive plates, each of said drive plates being composed of an electrically conductive material;
a plurality of support springs engaging and supporting said center electrode, said support springs comprising planar springs;
electrical circuit means for applying electrical drive pulses to said drive plates, said pulses having a frequency F, and a pulse width T of approximately 1/F divided by the total number of drive plates, said drive pulses being grouped into one main channel per operative upper/lower drive plate pair, each main channel ~~consisting of~~ comprising two sub-channel pulses, one sub-channel pulse operative on each drive plate, with said main channels being multiplexed to sequentially apply said pulses to said drive plates with said main channels being spaced apart in time by approximately the pulse width T, and said two sub-channel signals of the active main channel being applied simultaneously to the top/bottom drive plate pair;
sampling means for synchronously demodulating and demultiplexing the signal on the pickup plate into one channel per drive plate pair, each channel ~~consisting of~~ comprising two sub-channel signals;
timing means for controlling said sampling means such that each first sub-channel is sampled during the time period that the drive pulse is applied to the corresponding drive plate and each second sub-channel is sampled after the drive pulse corresponding to that drive plate has ended, and before the drive pulse corresponding to the next channel is applied;

storage means for each sub-channel; and

differential amplifier means to convert each of the sub-channel signal pairs into single main channel signals.

45. (Cancelled)

46. (Previously Presented) The capacitive transducer of Claim 19, wherein said pickup electrode means comprises a centrally located center electrode, with said drive plates comprising two groups disposed on opposing sides of said center electrode.

47. (Previously Presented) The capacitive transducer of Claim 46, wherein said main channel signals generated by said differential amplifier means constitutes the outputs of the transducer.

48. (Previously Presented) The capacitive transducer of Claim 46, wherein said drive plate electrodes comprise eight plates, with said two groups of drive plate electrodes comprising four plates each, further comprising:

electrical circuit means summing all four main channel signals together, said summed signal constituting the Z-axis output signal;

electrical circuit means generating the difference of two of said main channels, said difference signal constituting the X-axis output signal; and

electrical circuit means generating the difference of the two main channel signals not used to generate the X-axis output, said difference signal constituting the Y-axis output signal.

49. (Previously Presented) The capacitive transducer of Claim 46, wherein each of said main channel signals generated by said differential amplifier means are connected to feedback circuit means which produce feedback signals which control the amplitude of the drive plate pulses in response to displacement of the pickup electrode means relative to the drive plate electrodes, such that the induced voltage on the pickup electrode means is forced to zero, and the

feedback signals generated by said feedback circuit means are proportional to the displacement of the pickup electrode means relative to the drive plate electrodes.

50. (Previously Presented) The capacitive transducer of Claim 49, wherein said feedback signals constitute the outputs of the transducer.

51. (Previously Presented) The capacitive transducer of Claim 49, wherein said drive plate electrodes comprise eight plates, with said two groups of drive plate electrodes comprising four plates each, further comprising:

electrical circuit means summing all four feedback signals together, said summed signal constituting the Z-axis output signal;

electrical circuit means generating the difference of two of said feedback signals, said difference signal constituting the X-axis output signal; and

electrical circuit means generating the difference of the two feedback signals not used to generate the X-axis output, said difference signal constituting the Y-axis output signal.

52-57 (Cancelled).

Please add the following new claims:

58 (New) The transducer of Claim 44 wherein the plurality of pairs of drive plates includes a lower drive plate electrode assembly, the lower assembly including at least one pair of drive plates.

59. (New) The transducer of Claim 44 wherein the at least one pair of drive plates of the lower drive plate electrode assembly, the lower assembly including at least one pair of drive plates disposed on a substrate.

60. (New) The transducer of Claim 44 wherein the plurality of pairs of drive plates includes

a upper drive plate electrode assembly, the upper assembly including at least one pair of drive plates.

61. (New) The transducer of Claim 44 wherein the plurality of pairs of drive plates further comprises:

a lower drive plate electrode assembly, the lower assembly including at least one pair of drive plates; and

an upper drive plate electrode assembly, said upper assembly including a at least one pair of drive plates.

62. (New) The transducer of Claim 44 wherein the support springs are planar springs.

63. (New) The transducer of claim 44 wherein said center electrode comprises a planar electrode and said support springs lie on the same plane as said center electrode.

64. (New) The transducer of claim 44 wherein said center electrode and the support springs of said center electrode assembly are coplanar.

65. (New) The capacitive transducer of Claim 44 wherein said center electrode assembly comprises metal foil.

66. (New) The capacitive transducer of Claim 44 wherein said metal foil of said center electrode assembly comprises high strength beryllium copper alloy.

67. (New) The capacitive transducer of Claim 44 wherein said center electrode assembly is formed from a single sheet of foil.

68. (New) The capacitive transducer of Claim 44 wherein said center electrode assembly is formed from a single sheet of foil by photochemical etching.

69. (New) The capacitive transducer of Claim 44 wherein said center electrode assembly comprises a material having a thermal expansion coefficient similar to aluminum oxide.

70. (New) The capacitive transducer of Claim 44 wherein said center electrode assembly material is molybdenum.

71. (New) The capacitive transducer of Claim 44 wherein said transducer includes first spacer means disposed between said lower drive plate electrode assembly and said center electrode assembly and a second spacer means disposed between said upper drive plate electrode assembly and said center electrode assembly.

72. (New) The capacitive transducer of Claim 44 wherein drive plate electrodes of said drive plate electrode assemblies comprise copper foil having a thickness in the range of 0.0005 and 0.005 inches.